SPECTRUM®

**MicroMMAC-E
Management Module Guide**

CABLETRON SYSTEMS

The Complete Networking Solution™

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You should read this manual if you are going to manage a MicroMMAC-E Device through SPECTRUM.

Before reading this manual, you should be familiar with SPECTRUM's operation. Familiarity with network management is helpful, as is an understanding of the device hardware and firmware described in the ***MicroMMAC-22E and MicroMMAC-24E 10 Base-T Intelligent Stackable Hub User's Guide***.

What Is in This Guide

This guide is organized as follows:

Chapter	Description
Chapter 1 **Introduction**	Describes the MicroMMAC-E management module and model types.
Chapter 2 **Device Views**	Describes the MicroMMAC-E's Device View from the interface, chassis, and physical sites.
Chapter 3 **Configuration Views**	Describes the configuration views for the MicroMMAC-E Devices model and the device-specific management information provided by each view.
Chapter 4 **Event and Alarm Messages**	Contains a listing and explanation of typical event and alarm messages generated in the Event Log or Alarm View for the MicroMMAC-E Devices model type.

Conventions

In this manual the following conventions are used:

- Command names are printed in **bold**; for example, **Clear** or **Save & Close**.

- Menu selections to access a view are printed in **bold**; for example, **Configuration** or **Detail**.

- Buttons are represented by a shadowed box; for example:

Help

Related SPECTRUM Documentation

When using this guide, you should have a clear understanding of SPECTRUM functionality and navigation techniques as described in the Administration, Operation, and following documentation:

How to Manage a Network with SPECTRUM

SPECTRUM AutoDiscovery User's Guide

SPECTRUM MicroMMAC-22E and MicroMMAC-24E 10Base-T Intelligent Stackable Hub User's Guide

SPECTRUM Portable Management Application for the EMM-E6 User's Guide

Other Related Documentation

Computer Networks, Andrew S. Tanenbaum, Prentice-Hall, Inc.

Internetworking Technology Overview, Cisco Systems, Inc. (1993, Cisco Systems, Inc.)

LAN Troubleshooting Handbook, Mark Miller (1989, M&T Publishing, Inc.)

Local Area Networks, Architectures and Implementations, James Martin & Kathleen K. Chapman for the Arben Group, Inc. (1989, Prentice-Hall, Inc.)

The Simple Book — An Introduction to Management of TCP/IP-based Internets, Marshall T. Rose, Performance Systems International, Inc.

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Chapter 1

Introduction

What Is in This Chapter

This chapter describes the SPECTRUM Management Module for the MicroMMAC-E. It will also give you the model type names assigned to the MicroMMAC-E in SPECTRUM. (Model type name refers to the template used to specify attributes, actions, and associations for device models in SPECTRUM.)

MicroMMAC-E Management Module

The SPECTRUM MicroMMAC-E Management Module contains information necessary to manage MicroMMAC-Es, by using SPECTRUM's software emulation of the device attributes and functionality.

The MicroMMAC-E Management Module manages all MicroMMAC-E device models using the SNMP advanced network management agent and the Management Information Bases (MIBs), which come as part of the management module. The SPECTRUM model type name for the MicroMMAC-E device is as follows:

BRtrCSIuMMAC: A Cabletron Systems Micro Multi Media Access Center (uMMAC) Multi-Port Intelligent Bridging Routing Module.

The MicroMMAC-E is a multi-port intelligent repeater that can be stacked with the HubSTACK series of stackable workgroup hubs. The MicroMMAC-E provides management for up to five nonintelligent stackable Ethernet hubs.

The MicroMMAC-E also supports one optional Bridging Routing Interface Module (BRIM) which bridges packets from one transmission type to another

(e.g., Ethernet to: FDDI network backbones, Wide Area, or Ethernet, etc.). Other optional BRIMs are as follows:

- **BRIM-E**: Ethernet module with selectable media connections
- **BRIM-F6**: FDDI Dual Attached Station (DAS) connection
- **BRIM-WT1**: Wide Area NetworK (WAN)

When a BRIM is inserted into a MicroMMAC-E chassis, the icon dynamically changes from a hub icon to a bridging icon, demonstrating the additional bridging functionality provided by the BRIM. This is referred to as "in-the-hub bridging/routing."

To model these devices, you create a LAN_802_3 model representing each network the MicroMMAC-E is monitoring; you can then connect them to the device icon. This model type software "connects" a repeater icon to the repeater port and places it in the MicroMMAC-E Device Topology (DevTop) View. (The repeater model is related to the hub model with the "Manages" relation.) You copy these repeater icons into the LAN_802_3 icons to allow the hubs to gather performance statistics on each LAN_802_3 subnet.

The following chapters explain how to use SPECTRUM and the management module software to monitor and manage a MicroMMAC-E.

MicroMMAC-E Applications

The MicroMMAC-E Management Module supports both common and device-specific applications described in the *MIB II Applications, Bridging Applications, and Miscellaneous Applications references*. SPECTRUM management of a MicroMMAC-E is based on the following common and device-specific applications:

- Bridging (CSIBridge)
  - Ethernet Special Database (SDB) (Ct_BdgEnet_App)
  - PPP_BdgApp1474
  - Spanning Tree (Ct_Stp_App)
  - Static (Static_App)
  - Transparent (CT_Tp_App

- CtRouter (CtRouterApp
  - IP Routing (CtIP2App)
  - CtIPServices

- DLM (DLM_Agent)

- CtWANAppDS1

- PPP_LCPApp1471

- CtWANAppRS232
  - RFC1317sync

- DownLoad (CtDownLoadApp)

- Repeating (StckRptrRev4)

- MIB--II (SNMP2_Agent)
  - ICMP (ICMP_App)
  - IP (IP2_App)
  - System (System2_App)
  - UDP (UDP2_App)

- RMON App
  - RMONEthProbe

- CtWANApp

RMON/CtRouter/DLM are also supported. SPECTRUM management of these MIBs are purchased separately. Refer to the documentation provided with the each of the above management modules for descriptions of these capabilities (***RMON Management Guide***, ***Routing Services Management Module Guide***, and ***DLM Management Module Guide***).

NOTE

If there is an Uninterruptible Power Supply (UPS) connected to your device, CtUPS_App will show as a major software application.

- Device
- Devtop
- Performance
- Configuration
- Repeater Redundancy
- Source Address
- Repeater Security Configuration
- Model Information
- Utilities

These views are further detailed in the table below and in the *MIB II Applications's, Bridging Applications, and Miscellaneous Applications* references.

Table 1-1. **Stack Repeater**

Menu Selection	Description
Performance	Opens the Performance View. See ***SPECTRUM Performance View Reference***.
Stack Configuration	Opens the Stack Repeater Rev 4 (MicroMMac-E's Repeater). See Chapter 3 in this guide.
Repeater Redundancy	Opens the Repeater Configuration View. See Chapter 3 in this guide.
Repeater Source Address	Opens the Source Address View. See ***SPECTRUM Portable Management Application for the MicroMMAC-E User's Guide***.
Repeater Security Configuration	See ***SPECTRUM Portable Management Application for the MicroMMAC-E User's Guide***.
Model Information	Opens the Repeater Model Information View. See the SPECTRUM Views refernce.

SPMA and the MicroMMAC-E

SPMA for the MicroMMAC-E is described in the ***SPECTRUM Portable Management Application for the MicroMMAC-(E) User's Guide*** and the ***SPECTRUM Portable Management Application for the MicroMMAC-(E) Tools Guide***. For details on the following views, refer to the ***SPECTRUM Portable Management Application for the MicroMMAC-(E) User's Guide***:

- Chapter 2, *Using the MicroMMAC-(E) Hub View*, describes the visual display of the Hub and explains how to use the mouse within the Hub View; the operation of some basic functions available only from the Hub view are also described.

- Chapter 3, *Alarm Configuration*, describes how to set thresholds and enable or disable alarms at the network (channel), module, and port levels.

- Chapter 4, *Link/Seg Traps*, describes how to configure link and segmentation traps to suit your management needs.

- Chapter 5, *Repeater Redundancy*, describes how to configure redundant circuits to keep your network connections up and running in the event of a single port failure.

- Chapter 6, *Source Addressing*, describes how to display the Source Address List, how to set the aging time, and how to configure source address traps; it also describes the effects of source address locking.

- Chapter 7, *Security*, describes how to configure and manage the *LANVIEWSECURE* feature incorporated into the new generation of Cabletron's family of stackable hubs.

- Chapter 8, *Using the MicroMMAC-(E) Bridge View*, provides detailed instructions for configuring and managing the *MicroMMAC-(E)*'s powerful bridging capabilities, including monitoring bridge operation, using the special and filtering data bases, and setting forwarding thresholds and notification options.

For details on the following views, refer to the **SPECTRUM Portable Management Application Tools Guide**:

- Chapter 2, *Using the MIB I, MIB II Tool*, explains how to use this tool to view and change MIB I and MIB II object ID values.

- Chapter 3, *Using the Community Names Tool*, explains Cabletron's "Component" structure of device MIBs, and describes how to change device community names.

- Chapter 5, *Using TFTP Download Tool*, explains how to upgrade firmware on Cabletron devices equipped with Flash EEPROMs.

- Chapter 6, *The Traps Table Tool*, explains how to establish which network management workstations on your network will receive trap alarms from a selected device, and also provides a brief overview of some of the traps supported by Cabletron Systems' devices.

- Chapter 7, *Using Charts and Meters,* explains how to launch charts or meters (used to analyze device statistics) from a UNIX prompt, and control the Meter Tool's display.

- Chapter 8, *Configuring and Monitoring an Uninterruptible Power Supply*, introduces the UPS system (which connects a computer interface port to an intelligent MIM) and explains how to start, configure, and monitor the UPS Tool.

- Chapter 9, *Using DLM,* explains how to manage "smart hub" devices, or DLM Servers, on your network. Accessing the DLM Application and its windows, adding/deleting DLM entries, and managing DLM is also described.

- Chapter 10, *Using the Path Tool,* explains how to generate a list of router hops between a managed Cabletron device and a remote destination, and display specific information about each hop found in the router path.

- Chapter 11, *MIB Tree / MIB Tools*, provides an overview of the MIB Browser, the MIB Details tool, the MIB Editor, and browsing the MIB Tree.

Chapter 2

Device Views

What Is in This Chapter

This chapter provides a description of the Device View for the MicroMMAC-E Management Module, including an explanation of how to use the Interface, Chassis, and Physical representations of the MicroMMAC-E, access SPECTRUM generic views, and monitor performance.

- The **Chassis** View displays a logical view of the MicroMMAC-E chassis, its interfaces, and the other stacked chassis. From this view you can get information about the performance, configuration, and status of the modules; the stack (for example, repeater); the BRIM's bridge; and the ports.

- The **Interface** View displays a logical (narrative) view of the MicroMMAC-E's interfaces and provides access to information on their performance, status, and configuration.

- The **Physical** View displays a graphical representation of the device and its stack. This view gives access only to module information.

These Device Views show the MicroMMAC-E's configuration. When the configuration is modified, the display reflects those changes after the model's next polling cycle.

Figure 2-1 shows an example of the MicroMMAC-E Device Views.

Figure 2-1.   MicroMMAC-E Device View

Chassis Device View

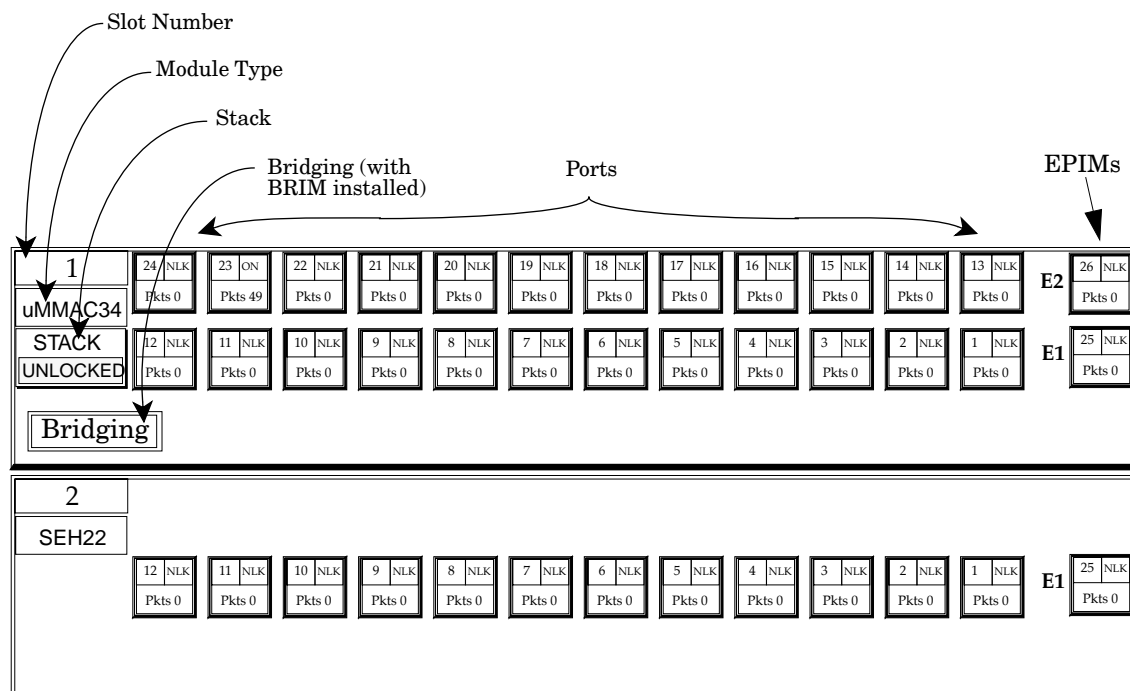Interface Device View

Physical Device View
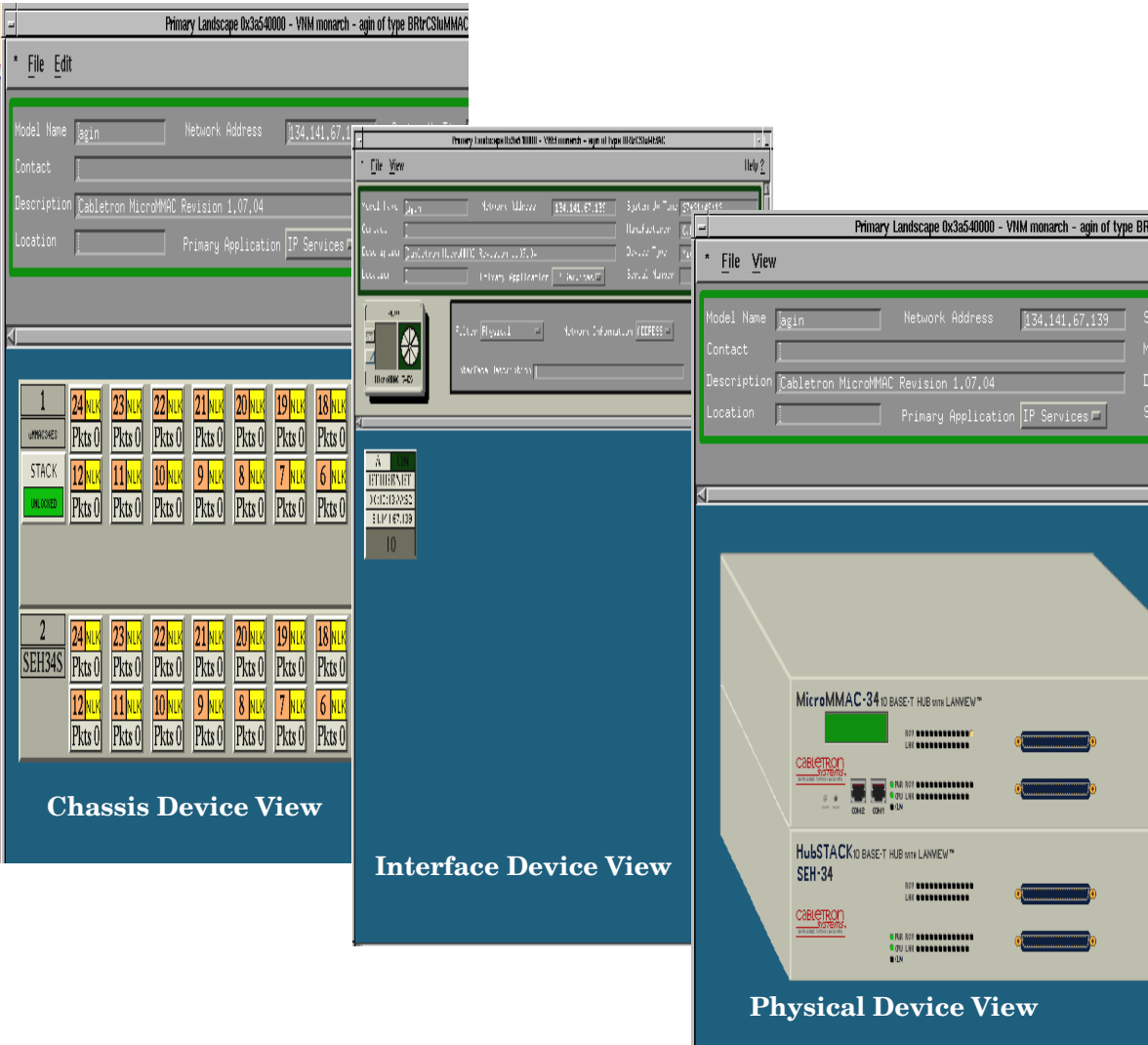
Chassis Device View

The MicroMMAC-E Chassis Device View shows a logical representation of each module in the stack.

From this view, you can go into several fields that access information about the chassis, the module, the repeater stack, bridging, and the ports. An overview of the process for accessing the Chassis Device View follows.

Each representation of a port includes a gauge which shows changes in traffic over that port as it occurs. Figure 2-2 displays the fields in the MicroMMAC-E Chassis Device View (Logical Module Fields and Menu Selections).
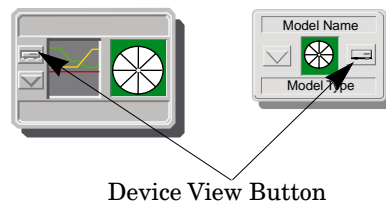
Figure 2-2. **Logical Module Fields and Menu Selections**

Accessing the MicroMMAC-E Chassis Device View

Access the Chassis Device View using one of the following methods:

- Double-click on the Device View button of the MicroMMAC-E device icon. This will open the Device View that was opened last (i.e. Chassis, Interface, or Physical).

Device View Button

- Highlight the MicroMMAC-E device icon and select **Device -> Chassis** from the Icon Subviews menu.
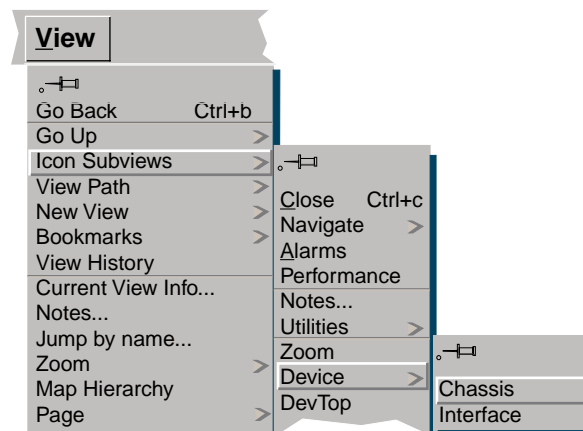
The fields in the MicroMMAC-E Chassis Device View and their related menus are described below:

Slot Number
The device's assigned stack number.

Module Type
The type of module being displayed. Table 2-1 outlines the Icon Subviews menu selections specific to the available types of modules.

Table 2-1.　　　**Module Menu Selections**

Menu Selection	Description
uMMAC Model Information (MicroMMAC-E only)	Opens the MicroMMAC-E Model Information View. See the **SPECTRUM Views** reference.
uMMAC Configuration (MicroMMAC-E only)	Opens the MicroMMAC-E Configuration View. See the **SPECTRUM Views** reference.
Application View (MicroMMAC-E only)	Opens the Application View. See the **SPECTRUM Views** reference.
Module Notes	Opens the Module Notes View.
Module Configuration	Opens the Module Configuration View. See Chapter 3, *Configuration Views*.
Module Performance	Opens the Module Performance View. See the **SPECTRUM Views** reference.
Module Frame & Error Breakdown	Opens the Module Frame & Error Breakdown View. See the **SPECTRUM Views** reference.
Module Frame Size	Opens the Module Frame Size & Protocols View. See the **SPECTRUM Views** reference.
Module DevTop View	Opens the Module's Device Topology View. See the **SPECTRUM Views** reference.
Enable All Ports	Enables all ports on the selected module.
Security Configuration	Opens Repeater1 Security and Module Security Views. See **SPECTRUM Portable Management Application for the MicroMMAC-E User's Guide**.

Stack

The **Stack** button provides access to views displaying information collected by the MicroMMAC-E's repeater stack. The Stack button will be either in a LOCKED, UNLOCKED, or MISMATCHED state depending on whether port security has been enabled. The stack provides the menu selections defined in Table 2-2.

Table 2-2.　　　**Stack Menu Selections**

Menu Selection	Description
Stack Performance	Opens the Stack Performance View. See the **SPECTRUM Views** reference.
Stack Frame & Error Breakdown	Opens the Stack Frame & Size Breakdown View. See the **SPECTRUM Views** reference.

Table 2-2. **Stack Menu Selections (Continued)**

Menu Selection	Description
Stack Frame Size & Protocols	Opens the Stack Frame Size View. See the ***SPECTRUM Views*** reference.
Stack Configuration	Opens the Stack Configuration View. See Chapter 3, *Configuration Views*.
Stack Model Information	Opens the Stack Model Information View. See the ***SPECTRUM Views*** reference.
Repeater Redundancy	Opens the Repeater Redundancy View. See ***SPECTRUM Portable Management Application for the MicroMMAC-E User's Guide***.
Repeater Source Address	Opens the Repeater Source Address View. See ***SPECTRUM Portable Management Application for the MicroMMAC-E User's Guide***.
Repeater Security Configuration	Opens Repeater1 Security View. See ***SPECTRUM Portable Management Application for the MIcroMMAC-E User's Guide***.

Bridging

The Bridging button shows information views collected by the bridge, provided that a BRIM is installed in your MicroMMAC-E. Please refer to ***How to Manage a Network with SPECTRUM*** for more information on Bridges.

Ports

Ports are the interfaces on the module:

- The MicroMMAC-22E and -32E have twelve RJ45 ports and one EPIM (Ethernet Port Interface Modules) port.

- The MicroMMAC-24E and -34E have twenty-four RJ45 ports and two EPIM ports. EPIM ports are designated as E1 and E2.

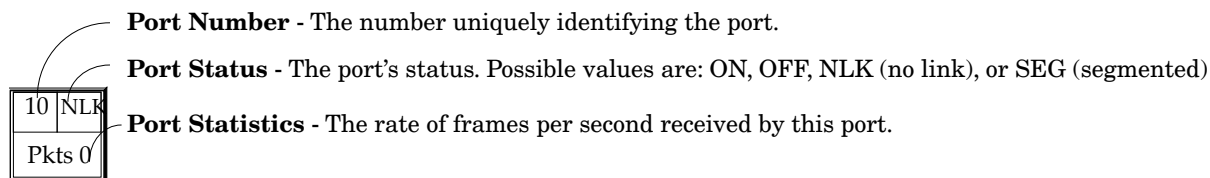Figure 2-3 shows the port icon's "at-a-glance" information:

Figure 2-3.   **Port Icon - Device Chassis View**

Port Number - The number uniquely identifying the port.

Port Status - The port's status. Possible values are: ON, OFF, NLK (no link), or SEG (segmented)

10	NLK
Pkts 0	

Port Statistics - The rate of frames per second received by this port.

Table 2-3 outlines the menu selections and information you can access from the port menu:

Table 2-3.   **Port Menu Selections**

| Menu Selection	Description
Port Notes	Opens the Port Notes View.
Port Configuration	Opens the Port Configuration View. See Chapter 3, *Configuration Views*.
Port Performance	Opens the Port Performance View. See the ***SPECTRUM Views*** reference.
Port Frame & Error Breakdown	Opens the Port Frame & Size Breakdown View. See the ***SPECTRUM Views*** reference.
Port Frame Size & Protocols	Opens the Port Frame Size & Protocols View. See the ***SPECTRUM Views*** reference.
Port Redundancy	Opens the Port Redundancy View. See ***SPECTRUM Portable Management Application for the MicroMMAC-E User's Guide***.
Port Source Address	Opens the Port Source Address View. See ***SPECTRUM Portable Management Application for the MicroMMAC-E User's Guide***.
Port Security Configuration	Opens Repeater1 Security and Port Security Views. See ***SPECTRUM Portable Management Application for the MicroMMAC-E User's Guide***.
Enable/Disable Port	Enables or disables the selected port.

Redundancy

SPECTRUM allows redundant circuit connections between any two or more hub devices that have redundant capability in their firmware. A circuit is established by a cable connection from one port on a primary hub device to one or more ports on secondary hub devices. The cable connections can use any valid cable type, including UTP/STP, coaxial, or fiber optic.

Any two or more cable connections create a complete circular circuit pathway between the two devices. One pathway is always set up as primary and the others as secondary or backup. The secondary circuit becomes active if the primary pathway fails. This allows the primary hub device to repeat data transmission on an alternative module port if a problem exists on the primary port.

Although circuit connections typically occur between devices in the same room, the circuit connections can also occur over longer distances between floors or buildings (with the proper cables and associated modules).

Refer to Figure 2-4 for an example of a redundant cable circuit connection between the device and a secondary hub device.

Figure 2-4.   Redundantly Connected Devices
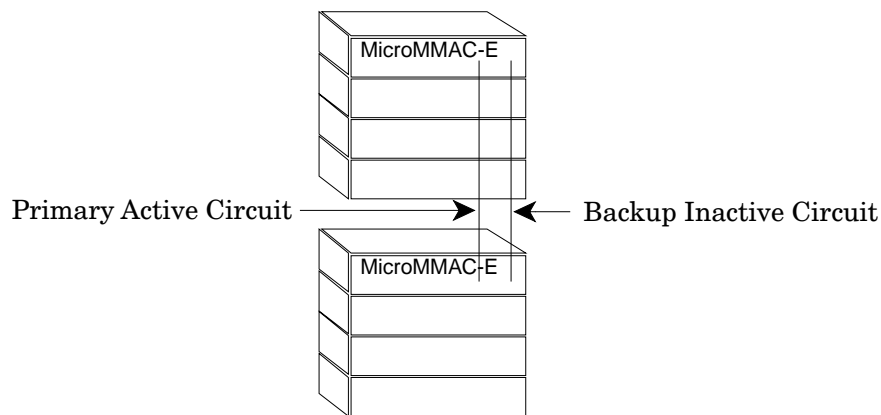
Views related to redundancy are the Repeater Redundancy and Port Redundancy Views. Descriptions of the fields found in these views and step-by-step instructions on configuring your network for redundancy are outlined in Chapter 5 of ***SPECTRUM Portable Management Applications for the MicroMMAC-E***.

Source Address Tables are used to determine which frames will be forwarded through the MicroMMAC-E from one network segment to another. This section, found in ***SPECTRUM Portable Management Applications for***

the MicroMMAC-E, provides a description of the source address views used to establish a source address table for the MicroMMAC-E.

Interface Device View

This section describes the functions of the Interface Icons and the Interface Options; information about the Device Icon Panel, which displays the MicroMMAC-E Location View Icon, can be found in the *SPECTRUM Views* reference. The Interface Device View includes three panels shown in Figure 2-5
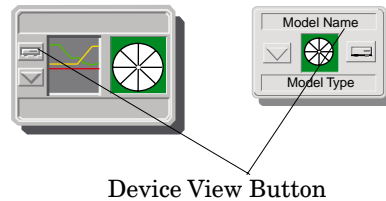
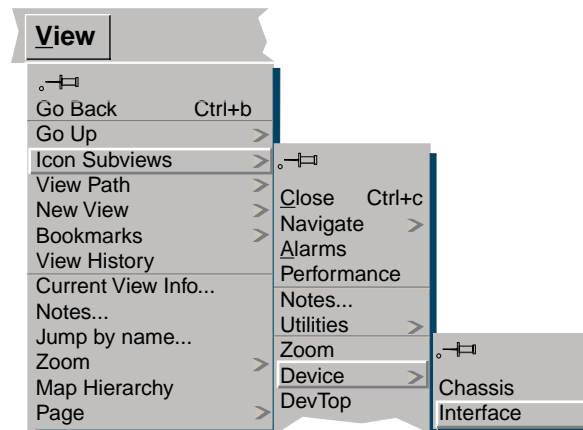**Figure 2-5.** **MicroMMAC-E Interface Device View**
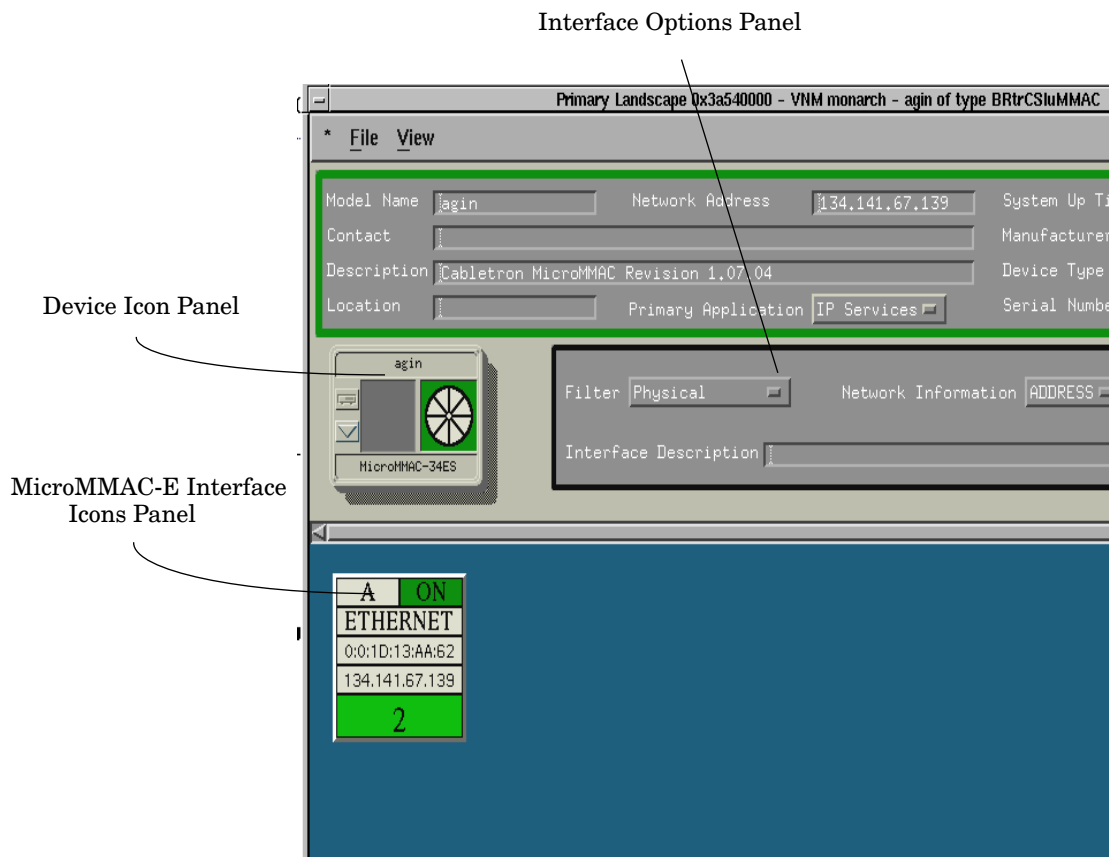
Accessing the Interface Device View

You can access the Interface Device View using one of the following methods:

- Double-click on the Device View button of the MicroMMAC-E device icon. This will open the Device View that was opened last (i.e. Chassis, Interface, or Physical).
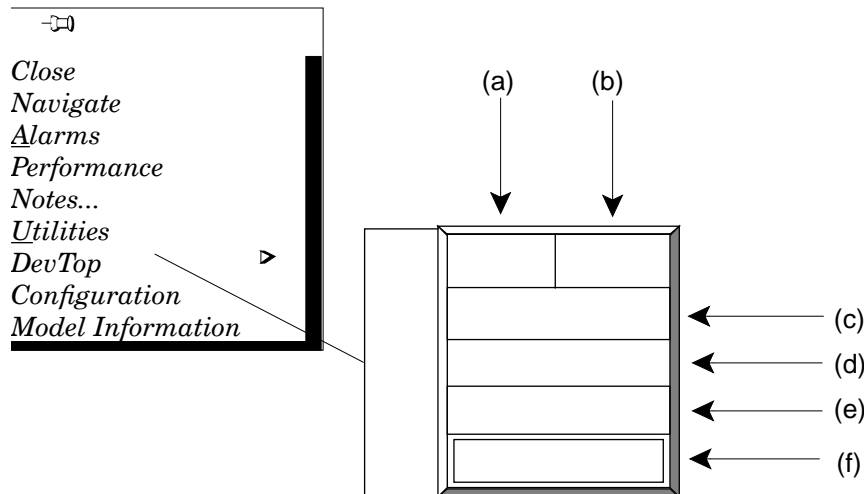
Device View Button

- Highlight the MicroMMAC-E device icon and select **Device -> Interface** from the Icon Subviews menu.

MicroMMAC-E Interface Icons Panel

This section describes the MicroMMAC-E Interface Icon, the icon's double-click zones, and associated views. Figure 2-6 is a model of the MicroMMAC-E Interface Icon.

Figure 2-6. **Micro MMAC Interface Icon**

(a) Device Topology View/Interface Number Label
(b) Port Configuration - CSIIfPort View/Administrative Status Label
(c) Port InterfaceType Label
(d) Interface Model Information View/MAC Address Label
(e) Network Information Label/Network Address Label
(f) Interface Performance - CSIIfPort View/Logical Gauge Label

Device Topology View/Interface Number Label

Double-clicking on this label of the Interface Icon takes you to the MicroMMAC-E Device Topology (DevTop) View. This label also gives you the number of this interface. Further information about the DevTop View can be found in the **SPECTRUM Views** reference.

Configuration - CSIIfPort View/Administrative Status Label

This label gives you the interface's administrative status as well as access to the Configuration - CSIIfPort View. The Administrative Status label includes a text label and a background color representing the current state of the interface. You can get this view by double-clicking on the label, or by highlighting the interface icon and using the right mouse button to select

Configuration from the Icon Subviews menu. Table 2-4 describes the information found in the Configuration - CSIIfPort View.

Table 2-4. **Configuration - CSIIfPort View**

Field	Description
Interface Index	Indicates the value identifying the interface.
Interface Type	Indicates the type of interface.
Operation Status	Indicates the current operating condition of the interface for which the entry exists.* Possible entries are: On (Green), Off (Blue), Test (Red), and (Yellow) when operational status is off and admin status is on.
Admin Status	Indicates the current administrative state of the interface for which the entry exists.* Possible entries: On (Green), Off (Blue), Test (Red), and (Yellow) when operational status is off and admin status is on. You can modify this field.
IF Description	Displays a textual description of the interface.

NOTE
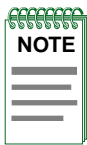
These colors are displayed as a background color in the interface icon found in the Device/Interface View section (b) only.

Interface Type Label

The Port Interface Type Label gives you the type of MicroMMAC-E interface. Possible interface types are shown in Table 2-5.

Table 2-5. **Interface Types**

Interface Type	Description
Other	None of the following
Reg1822	Regular 1822
HDH1822	HDLC Distant Host protocol
DDNX25	Defense Data Network X.25
rfc877X25	RFC877 X.25
Ethernet	Ethernet CSMA/CD

Table 2-5.   **Interface Types (Continued)**

Interface Type	Description
iso88023	ISO CSMA/CD
iso88024	ISO token bus
iso88025	ISO token ring
iso88026	ISO man
starLan	StarLAN IEEE (Institute of Electronic & Electrical Engineers) 802.3
Prot10MB	ProNET 10 Mbps
Prot80MB	ProNET 80 Mbps
HypChan	Hyperchannel
FDDI	Fiber Distributed Data Interface
LAPB	X.25 Line Access Procedure, Balanced
SDLC	IBM Synchronous Data Link Control protocol
T1	T1 link (USA and Japan)
CEPT	T1 link (Europe)
BasicISDN	Basic Integrated Services Digital Network
PrimISDN	Proprietary Integrated Services Digital Network
PPSerial	Proprietary Point to Point Serial
PPP	Point to Point Protocol
SFTWARLPBK	Software Loopback
CLNPoverIP	Connectionless Network Protocol over IP
Enet3MB	Ethernet 3 Mbps
XNSoverIP	Xerox Network Service Protocol over IP
SLIP	Generic Serial Line IP
ULTRA	ULTRA Technologies
T-3	T3 link
SMDS	Switched Multimegabit Data Service
FrameRelay	T1 Frame relay

Interface Model Information View/MAC Address Label

This label gives you the physical address of the MicroMMAC-E interface as well as access to interface model information. Double-clicking on this label of the icon opens the CSI Interface Port Model Information View. (You can also access these views by highlighting the interface icon and using the right mouse button to select **Model Information** from the Icon Subviews menu.) The definitions for these fields are described in the *SPECTRUM Views* reference.

Network Information Label/Network Address Label

This label gives you name, network address, and subnet mask information for the interface, according to the selections you made in the *Interface Options Panel*, see the next section.

Double-clicking on this label shows you the Network Information Panel. The network information entries from this panel can be displayed on the Network Address Label.

Interface Performance - CSIIfPort View/Logical Gauge Label

Double-clicking on this label of the Interface Icon gives you the Performance - CSIIfPort View. (This view can also be accessed by highlighting the Interface icon and using the right mouse button to select **Performance** from the Icon Subviews menu.) The Performance - CSIIfPort View summarizes network packet traffic flow for this interface. (Refer to the *SPECTRUM Views* reference for descriptions of this view's fields.)

This label dynamically tracks packet traffic; you can see it presented graphically through the Logical Gauge referred to in the *Interface Options Panel* section and outlined in Table 2-6.

Table 2-6.   Color and Statistical Definitions for Each Attribute

Statistic	Color	Description
% Transmitted	white	The percentage of the total number of packets that have been transmitted by this interface during uptime.
% Discarded	orange	The percentage of the total number of packets that have been discarded by this interface during uptime.
% Error	red	The percentage of the total number of packets that have contained errors by this interface during uptime.

Table 2-6. **Color and Statistical Definitions for Each Attribute (Continued)**

Statistic	Color	Description
% Host Bound	yellow	The percentage of the total number of packets that have been delivered to the local host from the interface during uptime.
# In Packet Rate p/s	light blue	The total number of packets that have been received by this interface during uptime.
# Out Packet Rate p/s	turquoise	The total number of packets that have been transmitted by this interface during uptime.
# Total Packet Rate p/s	royal blue	The total number of packets that have been transmitted and received by this interface during uptime.
In Load	green	The amount of bandwidth used per packets received during the interface's uptime.
Out Load	mustard green	The amount of bandwidth used per packets transmitted during the interface's uptime.
Total Load	light green	The amount of bandwidth used per packets received and transmitted during the interface's uptime.

Interface Options Panel

The Interface Options Panel area of the Device View allows you to modify the presentation of the Logical Interface Icon. It contains the fields described below as well as access to the Gauge Control Panel View.

Filter
The Filter area of the Interface Options Panel is only implemented if the SPECTRUM Routing Services Management Module is loaded.

Network Information
The Network Information area of the Interface Options Panel allows you to select the interface information displayed in the Network Information Label zone of that interface's Logical Interface Icon. Possible selections are ADDRESS, NAME, or MASK.

Interface Description
Selecting an Interface Icon displays the type of interface in the Interface Description area of the Interface Options Panel.

Gauge Control Panel View

The Gauge Control Panel View allows you to change the type of statistical information presented in the Logical Gauge area of the Logical Interface Icon.

To access the Gauge Control Panel, either double-click on the Interface Options Panel or single-click on the panel to highlight it and then use the right mouse button to select **Gauge Control Panel** from the Icon Subviews menu.

Selected Attribute

This area of the Gauge Control Panel allows you to select the statistical attribute displayed on the Logical Interface Icon's Gauge. The label changes color to reflect the attribute selected. Table 2-7 and Table 2-8 provide lists of attributes and their corresponding colors per gauge mode.

Gauge Mode

This area of the Gauge Control Panel allows you to select the mode presented by the Logical Gauge. Possible selections are Totals, Rates, or Percentages. The Percentages selection represents the percentage of the interface compared to the rest of the interfaces. In this model, the percentages are not implemented. Table 2-7 shows the attributes displayed when selecting the *Totals* gauge mode and Table 2-8 shows the attributes displayed when selecting the *Rates* gauge mode.

Table 2-7. **Gauge Mode Totals Attributes and Color Definitions**

Selected Attribute	Color
Errors	Orange
In Packets	Lt. Blue
Out Packets	Lt. Blue
In Octets	Green
Out Octets	Green
Discards	Tan
Forwarded	Lt. Purple
Host Bound	Yellow

Table 2-7. **Gauge Mode Totals Attributes and Color Definitions (Continued)**

Selected Attribute	Color
Transmitted	White
Filtered	Gray

Table 2-8. **Gauge Mode Rate Attributes and Color Definitions**

Selected Attribute	Color
Load	Green
Load In	Green
Load Out	Green
Packet Rate	Lt. Blue
In Packet Rate	Lt. Blue
Out Packet Rate	Lt. Blue
% Discard	Tan
% Filtered	Gray
% Forwarded	Lt. Violet
% Host Bound	Yellow
% Error	Orange
% Transmitted	White

Gauge Type

This option allows you to select either a numeric or linear representation of the Logical Gauge. The following section describes the Logical Gauge button.

Apply

Apply the current selections to the Logical Gauge by clicking on this button. The settings cannot be saved.

Gauge Control Panel Buttons

You can control the way the Gauge Control Panel selections affect the logical interface icon through using the following buttons:

Keep Settings

Click on this button to save the current gauge settings while running SpectroGRAPH.

Reset

When clicked on, this button resets the settings selections to the last kept settings.

Close

Click on this button to close the Gauge Control Panel.

Default

Click on this button to reset the default attribute to Load.

The Physical Device View

This section describes the module information available from the MicroMMAC-E Physical Device View, which displays a physical representation of the MicroMMAC-E module and its stack.

Accessing the Physical Device View

Access the Physical Device View using one of the following methods:

- Double-click on the Device View button of the MicroMMAC-E device icon. This will open the Device View that was opened last (i.e. Chassis, Interface, or Physical).

Device View Button
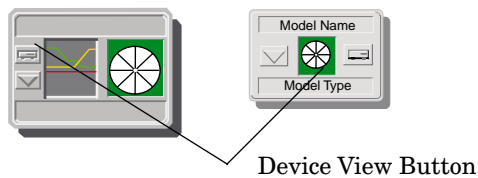
- Highlight the MicroMMAC-E device icon and select **Device -> Physical** from the Icon Subviews menu.
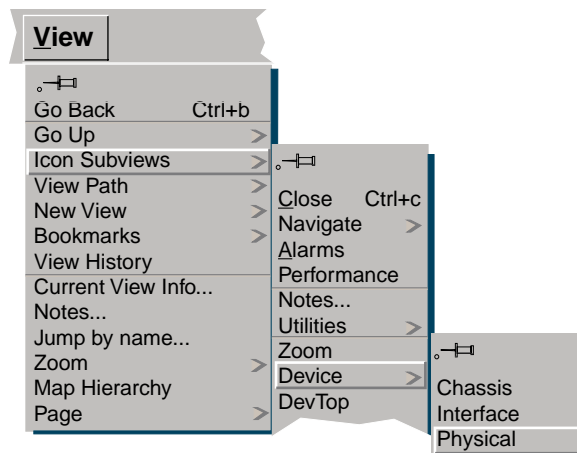
Figure 2-7. **Physical Device View**
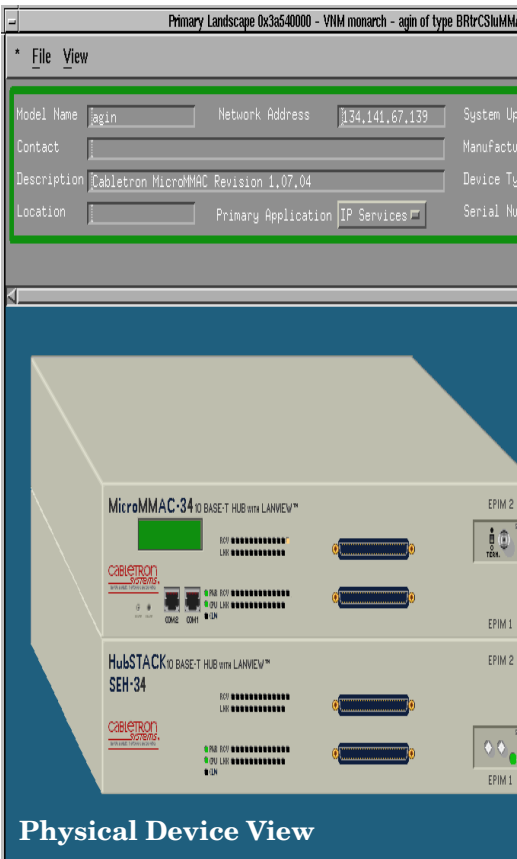
Non-generic selections related to the module icons in the MicroMMAC-E Physical Device View are described in Table 2-9.

Table 2-9.   **Physical Device View - Module Icon Menu Selections**

Menu Selection	Description
uMMAC Model Information	Opens the MicroMMAC-E Model Information View. See the **SPECTRUM Views** reference.
uMMAC Configuration	Opens the MicroMMAC-E Configuration View. See the **SPECTRUM Views** reference.
Application View	Opens the Application View. See the **SPECTRUM Views** reference.
Module Notes	Opens the Module Notes View.
Module Configuration	Opens the Module Configuration View. See Chapter 3, *Configuration Views*.
Module Performance	Opens the Module Performance View. See *the* **SPECTRUM Views** reference.
Module Frame & Error Breakdown	Opens the Module Frame & Size Breakdown View. See Chapter 3, *Configuration Views*.
Module Frame Size	Opens the Module Frame Size & Protocols View. See the **SPECTRUM Views** reference.
Module DevTop View	Opens the Module's Device Topology View. See the **SPECTRUM Views** reference.
Enable All Ports	Enables all ports on the selected module.

Chapter 3

ConfigurationViews

What Is in This Chapter

This chapter provides general descriptions of the configuration views that are available for the MicroMMAC-E. These views allow you to access device-specific configuration information.
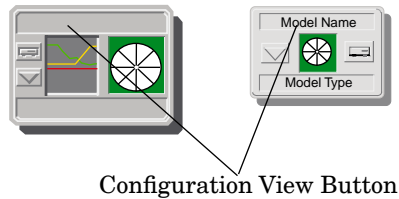
The MicroMMAC-E management module manages the following configuration views:

- Device
- Interface
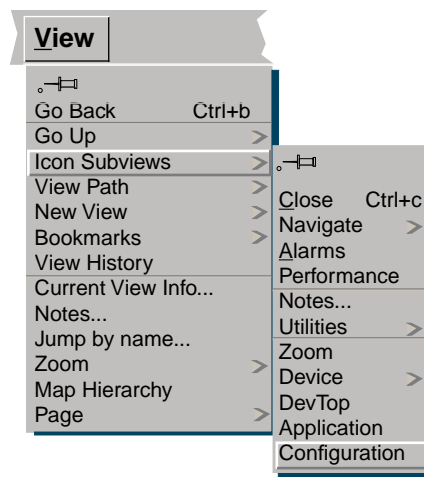- Module
- Port
- Stack Repeater

Accessing the MicroMMAC-E Device Configuration View

Access the Device Configuration View using one of the following methods:

- Double-click on the Configuration view label of the MicroMMAC-E device icon.

Configuration View Button

- Highlight the MicroMMAC-E device icon and select **Configuration** from the Icon Subviews menu.

MicroMMAC-E Device Configuration View

The MicroMMAC-E Device Configuration View provides information on the configuration and operating status of the MicroMMAC-E and includes the following information:

Contact Status
This field indicates if a connection with the device has been established.

Firmware Revision
The firmware revision for the device being modeled.

Hardware Revision
The hardware revision for the device being modeled.

Component Table

You click on this button to access the Community Name View. This view will give you information on the MicroMMAC-E components. For further information, see ***SPECTRUM Portable Management Application Tools Guide***.

DownLoad Application

Click on this button to access the DownLoad ApplicationView. This view allows you to upgrade the firmware for a MicroMMAC-E from a TFTP Boot or Bootp Server. For more information on this view, refer to ***SPECTRUM Portable Management Application Tools Guide***.

Trap Table

Click on this button to access the Trap Table View. This view allows you to enable and disable traps and specify the IP address of the management workstation that receives and processes the trap messages. For more information, see ***SPECTRUM Portable Management Application Tools Guide***.

Interface Configuration Table

The Interface Configuration Table gives you the following configuration information for each of the MicroMMAC-E's ports:

Number of Interfaces
Displays the number of interfaces available from this device.

Index
Displays the number of the interface.

Type
The Port Type Label displays the type of MicroMMAC-E interface. Possible interface types are shown in Table 3-1.

Table 3-1. **Port Interface Types**

Interface Type	Description
Other	None of the following
Reg1822	Regular 1822
HDH1822	HDLC Distant Host protocol
DDNX25	Defense Data Network X.25
rfc877X25	RFC877 X.25
Ethernet	Ethernet CSMA/CD
iso88023	ISO CSMA/CD
iso88024	ISO token bus
iso88025	ISO token ring
iso88026	ISO man
starLan	StarLAN IEEE (Institute of Electronic & Electrical Engineers) 802.3
Prot10MB	ProNET 10 Mbps
Prot80MB	ProNET 80 Mbps
HypChan	Hyperchannel
FDDI	Fiber Distributed Data Interface
LAPB	X.25 Line Access Procedure, Balanced
SDLC	IBM Synchronous Data Link Control protocol
T1	T1 link (USA and Japan)
CEPT	T1 link (Europe)
BasicISDN	Basic Integrated Services Digital Network
PrimISDN	Proprietary Integrated Services Digital Network
PPSerial	Proprietary Point to Point Serial
PPP	Point to Point Protocol
SFTWARLPBK	Software Loopback
CLNPoverIP	Connectionless Network Protocol over IP
Enet3MB	Ethernet 3 Mbps

Table 3-1.   **Port Interface Types (Continued)**

Interface Type	Description
XNSoverIP	Xerox Network Service Protocol over IP
SLIP	Generic Serial Line IP
ULTRA	ULTRA Technologies
T-3	T3 link
SMDS	Switched Multimegabit Data Service
FrameRelay	T1 Frame relay

Phy Address
The Ethernet (MAC) address of the interface.

Max Frame Size
The maximum frame size for the MicroMMAC-E interfaces.

Oper Status
The current operational state of this port (Up, Down, or Testing).

Module and Port Configuration Views

The Module and Port Configuration Views provide information on the configuration and operating status of selected modules or ports. You can access the Module Configuration View from the MicroMMAC-E Chassis Device View by clicking on the module to highlight it and then selecting **Module Configuration** from the Icon Subviews menu. You can access the Port Configuration View from the MicroMMAC-E Chassis Device View by clicking on the port to highlight it and then selecting **Port Configuration** from the Icon Subviews menu.

Module Management (Module Configuration View Only)

This area of the Module Configuration View provides the following port information for the selected module:

Port Count
The total number of ports on this module.

Ports On
The total number of ports currently in the ON state on this module.

Ports Operational
The number of operational ports on this module.

Module Ports
Setting this field to Enable enables all the ports on this module. Disable will disable all ports on the module. You can also enable module ports by selecting **Enable All Module Ports** from the Icon Subviews menu for the module.

Port Management (Port Configuration View Only)

This area of the Port Configuration View provides the following information for the selected port:

Port Id
The number of the module port.

Administrative Status
The desired operational state of the port (Enable or Disable). You can update this field.

Operational Status
The current operational state of the port (Not-Operational or Operational).

Segmentation Status
The current segmentation state of the port (Not-Segmented or Segmented).

Link Status
The current link state of the port (Not-Linked, Linked, or Not-Applicable).

Topological State
The current port topological state (Station or Trunk).

Set Topological State
The desired port topological state (Not_Forced or Forced_Trunk). You can update this field.

Trap Configuration

This area of the Module and Port Configuration View allows you to enable or disable any of the following types of traps:

Link Traps
When enabled, all packets indicating a change in link status are reported within the trap database.

Segmentation Traps
When enabled, all packets indicating a change in segmentation status are reported within the trap database.

Source Address Traps
When enabled, all packets indicating a change in source address are reported within the trap database.

Alarm Configuration

This area of the Module or Port Configuration View provides configuration and status information for generation of alarms by the selected module. The Alarm Configuration section provides the following information:

Traffic Alarms
This field displays whether traffic alarms are disabled or enabled. You can update this field.

Traffic Threshold
The threshold value within the alarm timebase which, once that number of packets is exceeded, generates a traffic alarm. You can update this field.

Traffic Alarm Condition
You can set this field to disable the module/port if the traffic alarm threshold is exceeded: an alarm for the module is generated. This is useful in preventing excessive network traffic from alarm messages transmitted by the module and aids in module troubleshooting.

Collision Alarms
This field displays whether collision alarms are disabled or enabled. You can update this field.

Collision Threshold
The threshold value within the alarm timebase which, once that number of collisions per good packet is exceeded, generates a collision alarm. You can update this field.

Collision Alarm Condition
You can set this field to disable the module/port if the collision alarm threshold is exceeded; an alarm for the module is generated. This is useful in

preventing excessive network traffic from alarm messages transmitted by the module and aids in module troubleshooting.

Broadcast Alarms

This field displays whether broadcast alarms are disabled or enabled. You can update this field.

Broadcast Threshold

The threshold value within the alarm timebase which, once that number of broadcast packets is exceeded, generates a broadcast alarm. You can update this field.

Broadcast Alarm Condition

You can set this field to disable the module/port if the broadcast alarm threshold is exceeded; an alarm for the module is generated. This is useful in preventing excessive network traffic from alarm messages transmitted by the module and aids in module troubleshooting.

Error Alarms

This field displays whether error alarms are disabled or enabled. You can update this field.

Error Threshold

The threshold value within the alarm timebase which, once the percentage of errors per good packet is exceeded, generates an error alarm.

Error Alarm Condition

You can set this field to disable the module/port if the error alarm threshold is exceeded; an alarm for the module is generated. This is useful in preventing excessive network traffic from alarm messages transmitted by the module and aids in module troubleshooting.

Error Source

The Error Source area of the Module or Port Configuration View provides a series of buttons allowing you to select error types to include in the error sum. You can modify the selectable error types. The selectable error types are as follows:

CRC

The number of packets received by the module with bad Cyclical Redundancy Checks (CRC).

Runts

The number of runt packets received by the module. A runt packet is one byte less than the standard Ethernet frame of 64 bytes (not including preamble).

OOW_Colls

The number of collisions out of the standard window (51.2µs) due to a network problem.

Alignment

The number of misaligned packets detected by the module.

No_Resource

The number of times the module ran out of resources (i.e., lack of buffer space) and could not accept packets.

Giants

The number of giant packets received by the module. A giant packet exceeds 1518 bytes (not including preamble).

Stack Repeater Configuration View

The Stack Repeater Configuration View provides information on the configuration and operating status of the network the repeater is monitoring. You can access the Stack Repeater Configuration View from the StckRptrRev4 Icon by selecting Stack Configuration option or from the Application View by clicking on the Repeating Icon and then selecting Configuration from the Icon Subviews menu.

Repeater Management

This area of the Repeater Configuration View provides the following port information:

Port Count

The total number of ports on this LAN segment.

Ports On

The total number of ports currently in the ON state on this network.

Ports Operational

The number of operational ports on this network.

Network Ports
Allows you to Enable/Disable the network ports on this network segment. You can update this field.

Network Port Security
Allows you to Lock/Unlock repeater ports. You can update this field.

Source Address Management

This section of the Repeater Configuration View indicates the timeout period in seconds.

Aging Interval
The time, in seconds, that dynamically learned forwarding information remains in the database before being selected. You can update this field.

Trap Configuration

This area of the Repeater Configuration View allows you to Enable or Disable any of the following types of traps:

Link Traps
When enabled, all packets indicating a change in link status are reported within the trap database.

Segmentation Traps
When enabled, all packets indicating a change in segmentation status are reported within the trap database.

Source Address Traps
When enabled, all packets indicating a change in source address are reported within the trap database.

Alarm Configuration

This area of the Repeater Configuration View provides configuration information on generating alarms for the selected module. The configuration information is as follows:

Timebase
This field allows you to set the alarm timebase. The timebase is the number of seconds used as the interval for performing all of the rate alarm checks. The minimum is 10 seconds. For example, if the timebase is 10 seconds, an alarm will occur only when the specified number of errors occurs within 10 seconds.

Traffic Alarms
This field displays whether traffic alarms are disabled or enabled. You can Enable/Disable traffic alarms.

Traffic Threshold
The threshold value within the alarm timebase which, once the number of packets is exceeded, generates a traffic alarm.

Collision Alarms
This field displays whether collision alarms are disabled or enabled. You can Enable/Disable collision alarms.

Collision Threshold
The threshold value within the alarm timebase which, once the number of collisions per good packet is exceeded, generates a collision alarm.

Broadcast Alarms
This field displays whether broadcast alarms are disabled or enabled. You can Enable/Disable broadcast alarms.

Broadcast Threshold
The threshold value within the alarm timebase which, once the number of broadcasts received is exceeded, generates a broadcast alarm.

Error Alarms
This field displays whether error alarms are disabled or enabled. You can Enable/Disable error alarms.

Error Threshold
The threshold value within the alarm timebase which, once the percentage of errors per good packet is exceeded, generates an error alarm.

Error Source

The Error Source area of the Repeater Configuration View provides a series of buttons allowing you to select the types of errors to include in the error sum. The selectable error types are as follows:

CRC
The amount of packets received by the module with bad CRC.

Runts
The amount of runt packets received by the module. A runt packet is one byte less than the standard Ethernet frame of 64 bytes (not including preamble).

OOW_Colls
The amount of collisions out of the standard window (51.2µs) due to a network problem.

Alignment
The amount of misaligned packets detected by the module.

No_Resource
The number of times the module ran out of resources (i.e., lack of buffer space) and could not accept packets.

Giants
The amount of giant packets received by the module. A giant packet exceeds 1518 bytes (not including preamble).

Board Map

The Board Map provides a series of read-only indicator buttons displaying the chassis slots occupied by the boards in this network.

Manages

This area of the Repeater Configuration View displays the Model Name of the device managing this repeater. This section also allows you to access the Device Configuration View by double-clicking on the Model Name or highlighting the address and clicking **OK**.

Chapter 4

Event and Alarm Messages

What Is in This Chapter

This chapter describes the types of events and alarms generated by the MicroMMAC-E and provides any probable cause messages corresponding to these alarms.

MicroMMAC-E Events and Alarms

Table 4-1 lists typical events and alarms for the MicroMMAC-E.

Table 4-1.   **MicroMMAC-E Events and Alarms**

Message in the Event Log	Alarm View
CsEvFormat/Event00010203 {d "%w- %d %m-, %Y - %T"} - The model created is not the same type as the device. Model type = {t}, Name = {m}, User = {u}. (event [{e}])	**CsPCause/Prob00010203** The model created is not the same type as the device.
CsEvFormat/Event00010306 {d "%w- %d %m-, %Y - %T"} - A(n) {t} device, named {m}, has been cold started. (event [{e}])	**No Probable Cause Message**

Table 4-1. **MicroMMAC-E Events and Alarms (Continued)**

Message in the Event Log	Alarm View
CsEvFormat/Event00010307 {d "%w- %d %m-, %Y - %T"} - A(n) {t} device, named {m} has been warm started. (event [{e}])	**No Probable Cause Message**
CsEvFormat/Event00010308 {d "%w- %d %m-, %Y - %T"} - A(n) {t} device, named {m}, has detected a communication Link Down. (event [{e}])	**CsPCause/Prob00010308** Communication link is down.
CsEvFormat/Event00010309 {d "%w- %d %m-, %Y - %T"} - A(n) {t} device, named {m}, has detected a communication Link Up. (event [{e}])	**No Probable Cause Message**
CsEvFormat/Event0001030a {d "%w- %d %m-, %Y - %T"} - A(n) {t} device, named {m}, has detected an Authentication Failure. (event [{e}])	**CsPCause/Prob0001030a** Authorization failure. Other user is trying to connect to device with an invalid community string.
CsEvFormat/Event00010401 {d "%w- %d %m-, %Y - %T"} - Device {m} of type {t} is created with an IP address already used by another model. (event [{e}])	**CsPCause/Prob00010401** DUPLICATE IP ADDRESS The model has the same IP address as that of some other model.
CsEvFormat/Event00010402 {d "%w- %d %m-, %Y - %T"} - Device {m} of type {t} is created with a physical (MAC) address already used by another model. (event [{e}])	**CsPCause/Prob00010402** DUPLICATE PHYSICAL ADDRESS The model has the same Physical address (MAC address) as that of some other model.

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